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10/650,272	08/28/2003	Haitao Zhang	020306	6605

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EXAMINER	
AHN, SAM K	

ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 11/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/650,272	ZHANG, HAITAO	
	Examiner	Art Unit	
	Sam K. Ahn	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-57* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8,9,27,28,46 and 47* is/are rejected.

7)☒ Claim(s) *1-7,10-26,29-45 and 48-57* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *013105*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1-57 are objected to because of the following informalities:

In claim 1, line 11, "the first estimated" should be "the estimated", line 12, "generate the estimated" should be "generate the", and the variables k, d_m, Λ, N and M should be defined in the claim.

In claim 3, line 2, "channel" should be "channel impulse response".

In claim 8, line 4, "less than" should be "and less than".

In claims 16-19, its dependency should be claim 9 to clarify its antecedent basis.

In claim 20, "the first estimated" should be "the estimated", line 12, "generate the estimated" should be "generate the", and the variables k, d_m, Λ, N and M should be defined in the claim, and in line 13, "h(t) with" should be "h(t).".

In claim 22, line 3, "channel" should be "channel impulse response".

In claims 35-38, its dependency should be claim 28 to clarify its antecedent basis.

In claim 39, "the first estimated" should be "the estimated", line 12, "generate the estimated" should be "generate the", and the variables k, d_m, Λ, N and M should be defined in the claim.

In claim 41, line 2, "channel" should be "channel impulse response".

In claim 47, line 4, "less than" should be "and less than".

In claims 54-57, its dependency should be claim 47 to clarify its antecedent basis.

Claims 2,4-7, 9-15,21,23-34,40,42-46,48-53 directly or indirectly depend on claim 1, 20 or 39. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 8,27 and 46 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for M=2, does not reasonably provide enablement for M=0 as recited in the claims. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

In claims 8,27 and 46, line 1, respectively, recite wherein M=0. The specification does provide an example of when M=2, on paragraph 0077 to compute the estimated communication channel impulse response with the equation given in the paragraph 0077. However, the specification does not reasonably convey to one skilled in the art of how M is applied when M=0. It appears that when M=0 is applied to same equation as M=2, M being in the denominator, 1 is divided by 0, note the equation on paragraph 0077. Is this the equation to be used when M=0? Or, should another equation be applied when M=0? Therefore, specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly

connected, to make and/or use the invention when M=0 commensurate in scope with these claims.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 9,28 and 47 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 12,30 and 48 of copending Application No. 10/650,271 (hereinafter, '271).

Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to one skilled in the art at the time the invention was made.

4. Regarding claim 9,

a. the claim recites

A method of estimating a communication channel impulse response h(t) comprising the steps of:

which is also recited in claim 12 of '271,

A method of estimating a communication channel impulse response h(t) comprising the steps of:

hence both the instant application and '271 recite the same method.

b. Claim 9 further recites

generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with a spreading sequence S_i of length N, wherein the received signal r(t) comprises a chip sequence c_j applied to a communication channel

characterizable by an impulse response h(t), **and wherein the chip sequence c_j is generated from a data sequence d_i spread by the spreading sequence S_i and wherein T_c is the chip period of the chip sequence c_j;**

which is also recited in claim 12 of '271,

generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with the spreading sequence S_i, wherein the received signal r(t) comprises the chip sequence c_j applied to the communication channel;

generating a chip sequence c_j having a chip period T_c as the data sequence d_i spread by a spreading sequence S_i of length N;

wherein the common limitations are emphasized. And although '271 does not explicitly teach that the communication channel is charaterizable by an impulse response h(t), it is well-known to one skilled in the art at the time the invention was made to recognize that any communication channel including the communication channel of the present application are characterizable by an impulse response h(t), as through channel impulse response, which is well-known in the art of determining the characteristic such as presence of noise in the channel. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that the communication channel is charaterizable by an impulse response h(t) of the instant application is well-known to one skilled in the art as any communication channel is characterizable by an impulse response h(t), as through channel impulse response, which is well-known to one skilled in in the art of determining the characteristic such as presence of noise in the channel.

And further, although '271 recites separate steps of generating a data sequence, generating a chip sequence, and generating $co_m(t)=co(t+mNT_c)$, while the instant application recites generating step of $co_m(t)=co(t+mNT_c)$ only, while fully reciting the data sequence and the chip sequence, one skilled in the art at the time the invention was made would recognize that the data sequence and the chip sequence generated was produced by a transmitter while the generating step of $co_m(t)=co(t+mNT_c)$ is performed at the receiver. Since claim 9 of the instant application recites the characteristics of the data sequence and of the chip sequence, the result in the step of $co_m(t)=co(t+mNT_c)$ of '271 and of the instant

application would be equivalent. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that '271 and of the instant application are not patentably distinct from each other resulting in the step of $co_m(t)=co(t+mNT_c)$.

c. and claim 9 recites,

generating an estimated communication channel impulse response $h_M(t)$ as a combination of $co_m(t)$ and d_m for m=0, 1, Λ, M

wherein claim 12 of '271 recites,

generating an estimated communication channel impulse response $h_M(t)$ as a combination of $co_m(t)$ and d_m for m=0, 1, Λ, M

hence, both the instant application and '272 recite the same limitation.

d. Claim 9 also recites,

filtering the first estimated communication channel impulse response $h_M(t)$ to generate the estimated communication channel impulse response h(t) with a filter f selected at least in part according to the spreading sequence S_i

wherein claim 12 of '271 recites,

step of filtering the estimated communication channel impulse response $h_M(t)$ with a filter f selected at least in part according to the spreading sequence S_i

wherein the "the estimated communication channel impulse response" of '271 and "the first estimated communication channel impulse response" of instant application are both referring to the same $h_M(t)$, hence are equivalent. And although the instant application recites that through the filtering step h(t) is generated, one skilled in the

art at the time the invention was made would recognize that any filtering step, including the filtering step of the instant application and of '271, involves filtering an input signal to produce an output signal, which is well-known to one skilled in the art, and therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that both the instant application and '271 filtering step would produce an output signal, or the h(t) as claimed, which is well-known to one skilled in the art.

e. and claim 9 recites,

wherein the data sequence d_i includes a constrained portion Cd_i associated with at least two codes w_0, w_1, wherein a correlation $A_{code}(k)$ of the constrained portion Cd_i with one of the codes w_0, w_1, is characterized by a maximum value at k=0 less than maximum values at $k \neq 0$

wherein claim 12 of '271 recites,

generating a data sequence d_i having a constrained portion Cd_i associated with at least two codes w_0, w_1, wherein a correlation $A_{code}(k)$ of the constrained portion Cd_i with one of the codes w_0, w_1, is characterized by a maximum value at k=0 less than maximum values at $k \neq 0$.

Although the instant application does not explicitly teach that the data sequence is generated by a generating step, it is well-known to one skilled in the art at the time the invention was made to recognize that any signal including the data sequence of the present application are produced by generating, as any signal cannot simply be present without a step of generating.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that generating a data sequence of the instant application is well-known to one skilled in the art as any signal cannot be simply present without a step of generating.

a. Regarding claim 28,

a. The claim recites

An apparatus for estimating a communication channel impulse response h(t), comprising:

which is also recited in claim 30 of '271,

An apparatus for estimating a communication channel impulse response h(t), comprising:

hence, both the instant application and '271 recite the same limitation;

b. Claim 28 also recites,

means for generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with a spreading sequence S_i of length N, wherein the received signal r(t) comprises a chip sequence c_j applied to a communication channel characterizable by an impulse response h(t), **and wherein the chip sequence c_j is generated from a data sequence d_i spread by the spreading sequence S_i and wherein T_c is the chip period of the chip sequence c_j;**

wherein claim 30 of '271 recites

means for generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with the spreading sequence S_i, wherein the received signal r(t) comprises the chip sequence c_j applied to the communication channel;

means for generating a chip sequence c_j having a chip period T_c as the data sequence d_i spread by a spreading sequence S_i of length N;

wherein the common limitations are emphasized. And although '271 does not explicitly teach that the communication channel is charaterizable by an impulse response h(t), it is well-known to one skilled in the art at the time the invention was made to recognize that any communication channel including the communication channel of the present application are characterizable by an impulse response h(t), as through channel impulse response, which is well-known in the art of determining the characteristic such as presence of noise in the channel. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that the communication channel is charaterizable by an impulse response h(t) of the instant application is well-known to one skilled in the art as any communication channel is characterizable by an impulse response h(t), as through channel impulse response, which is well-known to one skilled in in the art of determining the characteristic such as presence of noise in the channel.

And further, although '271 recites separate means for generating a data sequence, generating a chip sequence, and generating $co_m(t)=co(t+mNT_c)$, while the instant application recites generating step of $co_m(t)=co(t+mNT_c)$ only, while fully reciting the

data sequence and the chip sequence, one skilled in the art at the time the invention was made would recognize that the data sequence and the chip sequence generated was produced by a transmitter while the generating step of $co_m(t)=co(t+mNT_c)$ is performed at the receiver. Since claim 28 of the instant application recites the characteristics of the data sequence and of the chip sequence, the result in the step of $co_m(t)=co(t+mNT_c)$ of '271 and of the instant application would be equivalent. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that '271 and of the instant application are not patentably distinct from each other resulting in the output of the means for generating of $co_m(t)=co(t+mNT_c)$.

c. And claim 28 recites,

means for generating an estimated communication channel impulse response $h_M(t)$ as a combination of $co_m(t)$ and d_m for m=0, 1, Λ, M

wherein claim 30 of '271 recites,

means for generating an estimated communication channel impulse response $h_M(t)$ as a combination of $co_m(t)$ and d_m for m=0, 1, Λ, M

hence, both the instant application and '271 recite the same limitation.

d. claim 28 also recites,

a filter means f, selected at least in part according to the spreading sequence S_i, the filter means for filtering the first estimated communication channel impulse response $h_M(t)$ to generate the estimated communication channel impulse response h(t) with

wherein claim 30 of '271 recites,

step of filtering the estimated communication channel impulse response $h_M(t)$ with a filter f selected at least in part according to the spreading sequence S_i

wherein it appears that the step of filtering in claim 30 of '271 should recite as a filter means, since it depends on an apparatus claim, the "the estimated communication channel impulse response" of '271 and "the first estimated communication channel impulse response" of instant application are both referring to the same $h_M(t)$, hence are equivalent. And although the instant application recites that through the filtering step h(t) is generated, one skilled in the art at the time the invention was made would recognize that any filtering step, including the filtering step of the instant application and of '271, involves filtering an input signal to produce an output signal, which is well-known to one skilled in the art, and therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that both the instant application and '271 filtering step would produce an output signal, or the h(t) as claimed, which is well-known to one skilled in the art.

e. claim 28 further recites

wherein the data sequence d_i includes a constrained portion Cd_i associated with at least two codes w_0, w_1, wherein a correlation $A_{code}(k)$ of the constrained portion Cd_i with one of the codes w_0, w_1, is characterized by a maximum value at k=0 less than maximum values at $k \neq 0$;

wherein claim 30 of '271 recites,

means for generating a data sequence d_i having a constrained portion Cd_i associated with at least two codes w_0, w_1, wherein a correlation $A_{code}(k)$ of the constrained portion Cd_i with one of the codes w_0, w_1, is characterized by a maximum value at k=0 less than maximum values at $k \neq 0$.

Although the instant application does not explicitly teach that the data sequence is generated, it is well-known to one skilled in the art at the time the invention was made to recognize that any signal including the data sequence of the present application are produced by generating, as any signal cannot simply be present without a step of generating.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that generating a data sequence of the instant application is well-known to one skilled in the art as any signal cannot be simply present without a step of generating.

b. Regarding claim 47,

a. The claim recites

An apparatus for estimating a communication channel impulse response h(t), comprising:

which is also recited in claim 48 of '271,

An apparatus for estimating a communication channel impulse response h(t), comprising:

hence, both the instant application and '271 recite the same limitation;

b. Claim 47 also recites,

a correlator generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with a spreading sequence S_i of length N, wherein the received signal r(t) comprises a chip sequence c_j applied to a communication channel characterizable by an impulse response h(t), **and wherein the chip sequence c_j is generated from a data sequence d_i spread by the spreading sequence S_i and wherein T_c is the chip period of the chip sequence c_j;**

wherein claim 30 of '271 recites

means for generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with the spreading sequence S_i, wherein the received signal r(t) comprises the chip sequence c_j applied to the communication channel;

means for generating a chip sequence c_j having a chip period T_c as the data sequence d_i spread by a spreading sequence S_i of length N;

wherein the common limitations are emphasized. And although '271 does not explicitly teach that the communication channel is charaterizable by an impulse response h(t), it is well-known to one skilled in the art at the time the invention was made to recognize that any communication channel including the communication channel of the present application are characterizable by an impulse response h(t), as through channel impulse response, which is well-known in the art of determining the characteristic such as presence of noise in the channel. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to

recognize that the communication channel is charaterizable by an impulse response h(t) of the instant application is well-known to one skilled in the art as any communication channel is characterizable by an impulse response h(t), as through channel impulse response, which is well-known to one skilled in in the art of determining the characteristic such as presence of noise in the channel.

And further, although '271 recites separate means for generating a data sequence, generating a chip sequence, and generating $co_m(t)=co(t+mNT_c)$, while the instant application recites generating step of $co_m(t)=co(t+mNT_c)$ only, while fully reciting the data sequence and the chip sequence, one skilled in the art at the time the invention was made would recognize that the data sequence and the chip sequence generated was produced by a transmitter while the generating step of $co_m(t)=co(t+mNT_c)$ is performed at the receiver. Since claim 28 of the instant application recites the characteristics of the data sequence and of the chip sequence, the result in the step of $co_m(t)=co(t+mNT_c)$ of '271 and of the instant application would be equivalent. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that '271 and of the instant application are not patentably distinct from each other resulting in the output of the means for generating of $co_m(t)=co(t+mNT_c)$.

c. And claim 47 recites,

an estimator for generating an estimated communication channel impulse response $h_M(t)$ as a combination of $co_m(t)$ and d_m for m=0, 1, Λ, M

wherein claim 48 of '271 recites,

an estimator for generating an estimated communication channel impulse response $h_M(t)$ as a combination of $co_m(t)$ and d_m for m=0, 1, Λ, M

hence, both the instant application and '271 recite the same limitation.

d. claim 47 also recites,

a filter f selected at least in part according to the spreading sequence S_i, the filter for filtering the first estimated communication channel impulse response $h_M(t)$ to generate the estimated communication channel impulse response h(t).

wherein claim 48 of '271 recites,

step of filtering the estimated communication channel impulse response $h_M(t)$ with a filter f selected at least in part according to the spreading sequence S_i

wherein it appears that the step of filtering in claim 48 of '271 should recite as a filter means, since it depends on an apparatus claim, the "the estimated communication channel impulse response" of '271 and "the first estimated communication channel impulse response" of instant application are both referring to the same $h_M(t)$, hence are equivalent. And although the instant application recites that through the filtering step h(t) is generated, one skilled in the art at the time the invention was made would recognize that any filtering step, including the filtering step of the instant application and of '271, involves filtering an input signal to produce an output signal, which is well-known to one skilled in the art, and therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that both the instant application and '271 filtering step would produce an output signal, or the h(t) as claimed, which is well-known to one skilled in the art.

e. claim 47 further recites

wherein the data sequence d_i includes a constrained portion Cd_i associated with at least two codes w_0, w_1, wherein a correlation $A_{code}(k)$ of the constrained portion Cd_i with one of the codes w_0, w_1, is characterized by a maximum value at k=0 less than maximum values at $k \neq 0$;

wherein claim 48 of '271 recites,

means for generating a data sequence d_i having a constrained portion Cd_i associated with at least two codes w_0, w_1, wherein a correlation $A_{code}(k)$ of the constrained portion Cd_i with one of the codes w_0, w_1, is characterized by a maximum value at k=0 less than maximum values at $k \neq 0$.

Although the instant application does not explicitly teach that the data sequence is generated, it is well-known to one skilled in the art at the time the invention was made to recognize that any signal including the data sequence of the present application are produced by generating, as any signal cannot simply be present without a step of generating.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that generating a data sequence of the instant application is well-known to one skilled in the art as any signal cannot be simply present without a step of generating.

This is a provisional obviousness-type double patenting rejection.

Allowable Subject Matter

7. Claims 1-7,10-26,29-45 and 48-57 would be allowable if rewritten or amended to overcome the claim objections, set forth in this Office action.
8. Claims 9,28 and 47 would be allowable if rewritten or amended to overcome the claim objections, and double patenting rejection, set forth in this Office action.
9. The following is a statement of reasons for the indication of allowable subject matter: present application discloses a method and apparatus for estimating a channel impulse response of a signal received via a communication channel wherein transmitted signal spreaded by a chip sequence is correlated at a receiver. Prior art teaches the limitations above, but do not explicitly teach the combination of generating estimated channel impulse response of combination of $co_m(t) = co(t + mNTc)$ and received data sequence as a correlator output, and filtering estimated channel impulse response wherein the filter is based on the spreading sequence, as claimed in claims 1,20 and 39.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

    Bar-David et al. US 5,623,511 teach estimation of channel impulse response in a wireless environment wherein the signal is spreaded by Barker code.

    Ibrahim et al. US 2004/0052306 A1 teach a receiver comprising channel estimation coupled to a matched filter and channel matched filter.

Webster et al. US 6,661,857 B1 teach a wireless receiver comprising channel estimator.

Westman US 6,680,967 B1 teaches a receiver comprising plurality of correlation coupled to a channel estimator and a filter for use in a wireless system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sam K. Ahn
Patent Examiner

11/16/06